

AMENDMENTS OF THE CLAIMS

This listing of the claims if entered, will replace all prior versions and listings of claims in the application:

Listing of Claims

1. (currently amended) A method of selecting an operating speed of a memory module interface in a computer system, said system comprising a central processing unit, a memory controller, and at least one memory module comprising a serial presence detect memory, said method comprising:

counting the number of said memory modules;
keeping a running tally of the number of said memory modules based on said counting;

generating multiple clock signals at different frequencies to provide selectable operating speeds of said memory module interface; and

~~selecting one of said operating speeds of said memory module interface~~ based on at least a final tally of the number of said memory modules, selecting only one of said multiple clock signals to provide said operating speed of said memory module interface.

2. (currently amended) The method of claim 1 wherein said selecting comprises generating memory module interface signals comprising clock, address, and data signals at a frequency based on said [[the]] final tally of the number of said memory modules.

3. (currently amended) The method of claim 1 further comprising obtaining information from said serial presence detect memory that includes at least one characteristic of said memory module, wherein said selecting

comprises selecting only one of said ~~operating speeds in accordance with one of said the~~ multiple clock signals based on at least said final tally of the number of said memory modules and said characteristic.

4. (original) The method of claim 3 wherein said characteristic comprises the number of components in each said memory module.

5. (original) The method of claim 3 wherein said characteristic comprises a speed grade of said memory module.

6. (original) The method of claim 3 wherein said characteristic comprises a manufacturer of said memory module.

7. (original) The method of claim 3 wherein said characteristic comprises a type of said memory module.

8. (original) The method of claim 3 wherein said characteristic comprises a physical layout of signal connections between said memory controller and said memory module.

9. (currently amended) A method of selecting an operating speed of a memory module interface in a computer system, said system comprising a central processing unit, a memory controller, and at least one memory module comprising a serial presence detect memory, said method comprising:

generating multiple clock signals at different frequencies to provide selectable operating speeds of said memory module interface;

counting the number of said memory modules;

keeping a running tally of the number of said memory modules based on said counting;

obtaining information from said serial presence detect memory that includes at least one characteristic of said memory module; and

~~selecting said operating speed of said memory module interface~~ in accordance with at least ~~one of~~ a final tally of the number of said memory modules and said obtaining information, selecting only one of said multiple clock signals to provide said operating speed of said memory module interface.

10. (original) The method of claim 9 wherein said characteristic comprises a type of said memory module.

11. (currently amended) A method of selecting an operating speed of a memory module interface in a computer system, said system comprising a central processing unit, a memory controller, and at least one memory module comprising a serial presence detect memory, said method comprising:

generating multiple clock signals at different frequencies to provide selectable operating speeds of said memory module interface;

obtaining information from said serial presence detect memory that includes at least the number of components in each said memory module; and

~~selecting said operating speed of said memory module interface~~ in accordance with said obtaining information, selecting only one of said multiple clock signals to provide said operating speed of said memory module interface.

12. (currently amended) A method of selecting an operating speed of a memory module interface in a computer system, said system comprising a central processing unit, a memory controller, and at least one memory module comprising a serial presence detect memory, said method comprising:

generating multiple clock signals at different frequencies to provide selectable operating speeds of said memory module interface;

counting the number of said memory modules;
keeping a running tally of the number of said
memory modules based on said counting;

obtaining information from said serial presence detect memory that includes at least a speed grade of said memory module; and

~~selecting said operating speed of said memory~~
~~module interface in accordance with~~ at least a final tally of
the number of said memory modules and said obtaining
information, selecting only one of said multiple clock signals
to provide said operating speed of said memory module
interface.

13. (currently amended) A computer system comprising:

a central processing unit;
a memory controller including a memory module interface; and

at least one memory module including a serial presence detect memory; wherein said memory controller:
generates multiple clock signals at different frequencies;

accesses said serial presence detect memory;

keeps a running tally of the number of said memory modules based on said accesses to said serial presence detect memory; and

~~selects one of said clock frequencies for driving said memory module interface~~ based on at least a final tally of the number of said memory modules, selects only one of said multiple clock signals to provide an operating speed of said memory module interface.

14. (original) The computer system of claim 13 wherein said central processing unit is a microprocessor.

15. (original) The computer system of claim 13 wherein said memory controller obtains information from said serial presence detect memory that includes at least one characteristic of each said memory module.

16. (original) The computer system of claim 15 wherein said characteristic comprises the number of components in each said memory module.

17. (original) The computer system of claim 15 wherein said characteristic comprises a speed grade of said memory module.

18. (original) The computer system of claim 15 wherein said characteristic comprises a manufacturer of said memory module.

19. (original) The computer system of claim 15 wherein said characteristic comprises a type of said memory module.

20. (original) The computer system of claim 15 wherein said characteristic comprises a physical layout of signal connections between said memory controller and said memory module.

21. (currently amended) A computer system comprising:

a central processing unit;

a memory controller including a memory module interface and at least two PLLs to generate respective clock signals of different frequencies;

at least one memory module including a serial presence detect memory; wherein said memory controller:

accesses said serial presence detect memory;

keeps a running tally of the number of said memory modules based on said accesses to said serial presence detect memory;

obtains information from said serial presence detect memory that includes at least one characteristic of said memory module; and

~~provides a memory module interface at a clock-~~
~~rate based on at least one of a final tally of the number of~~
said memory modules and said obtained information, selects
only one of said clock signals to provide an operating speed
of said memory module interface.

22. (original) The computer system of claim 21 wherein said characteristic comprises the number of components in each said memory module.

23. (currently amended) A computer system comprising:

a central processing unit;

a memory controller including a memory module interface and at least two PLLs to generate respective clock signals of different frequencies;

at least one memory module including a serial presence detect memory; wherein said memory controller:

accesses said serial presence detect memory;

~~keeps a running tally of the number of said memory modules based on said accesses to said serial presence detect memory;~~

obtains information from said serial presence detect memory that includes at least the number of components in each memory module; and

~~provides a memory module interface at a clock rate based on at least one of a final tally of the number of said memory modules and said obtained information, selects~~
only one of said clock signals to provide an operating speed of said memory module interface.

24. (currently amended) A computer system comprising:

a central processing unit;

a memory controller including a memory module interface and at least two PLLs to generate respective clock signals of different frequencies;

at least one memory module including a serial presence detect memory; wherein said memory controller:

accesses said serial presence detect memory;

keeps a running tally of the number of said memory modules based on said accesses to said serial presence detect memory;

obtains information from said serial presence detect memory that includes at least a speed grade of said memory modules or their components; and

~~provides a memory module interface at a clock rate based on at least one of a final tally of the number of said memory modules and said obtained information,~~ selects only one of said clock signals to provide an operating speed of said memory module interface.

25. (currently amended) A computer system comprising:

a central processing unit;

at least one memory module including a serial presence detect memory; and

memory controller means including memory module interface means; wherein said memory controller means:

generates multiple clock signals at different frequencies;

accesses serial presence detect memory;

keeps a running tally of the number of said memory modules based on said accesses to said serial presence detect memory; and

~~selects one of said clock frequencies for driving said memory module interface means at a clock rate based on at least a final tally of the number of said memory modules,~~ selects only one of said multiple clock signals for driving said memory module interface means.

26. (currently amended) A computer system comprising:

a central processing unit;

at least one memory module including a serial presence detect memory; and

memory controller means including memory module interface means and means for generating multiple clock signals at different frequencies; wherein said memory controller means:

accesses serial presence detect memory;

keeps a running tally of the number of said memory modules based on said accesses to said serial presence detect memory;

obtains information from said serial presence detect memory that includes at least one characteristic of said memory module; and

~~provides a memory module interface means at a clock rate based on at least one of a final tally of the number of said memory modules and said obtained information,~~
selects only one of said multiple clock signals to provide an operating speed of said memory module interface means.

27. (original) The computer system of claim 26 wherein said characteristic comprises a type of said memory module means.

28. (original) The computer system of claim 26 wherein said characteristic comprises a physical layout of signal connections between said memory controller means and said memory module means.

29. (currently amended) A computer system comprising:

a central processing unit;
at least one memory module including a serial presence detect memory; and
memory controller means including memory module interface means and means for generating multiple clock signals at different frequencies; wherein said memory controller means:

accesses serial presence detect memory;
~~keeps a running tally of the number of said memory modules based on said accesses to said serial presence detect memory;~~

obtains information from said serial presence detect memory that includes at least the number of components in each memory module means; and

~~provides a memory module interface means at a clock rate based on at least one of a final tally of the number of said memory modules and said obtained information,~~
selects only one of said multiple clock signals to provide an operating speed of said memory module interface means.

30. (currently amended) A computer system comprising:

a central processing unit;
at least one memory module including a serial presence detect memory; and
memory controller means including memory module interface means and means for generating multiple clock signals at different frequencies; wherein said memory controller means:

accesses serial presence detect memory;

keeps a running tally of the number of said memory modules based on said accesses to said serial presence detect memory;

obtains information from said serial presence detect memory that includes at least a speed grade of said memory module or its components; and

~~provides a memory module interface means at a~~
~~clock rate based on at least one of a final tally of the~~
number of said memory modules and said obtained information,
selects only one of said multiple clock signals to provide an
operating speed of said memory module interface means.

31. (currently amended) A memory controller comprising a memory module interface to at least one memory module, said memory module including serial presence detect memory; wherein said memory controller:

generates multiple clock signals at different
~~clocks rates~~ frequencies;

accesses serial presence detect memory;

keeps a running tally of the number of said memory modules based on said accesses to said serial presence detect memory; and

~~provides a memory module interface at one of~~
~~said clock rates~~ based on at least a final tally of the number of said memory modules, selects only one of said multiple clock signals to provide an operating speed of said memory module interface.

32. (currently amended) The memory controller of claim 31 wherein said memory controller obtains information from said serial presence detect memory that includes at least

one characteristic of said memory module wherein said selected clock ~~rate~~ signal is also based on said characteristic.

33. (previously presented) The memory controller of claim 32 wherein said characteristic comprises the number of components of said memory module.

34. (previously presented) The memory controller of claim 32 wherein said characteristic comprises a speed grade of said memory module.

35. (previously presented) The memory controller of claim 32 wherein said characteristic comprises a manufacturer of said memory module.

36. (previously presented) The memory controller of claim 32 wherein said characteristic comprises a type of said memory module.

37. (previously presented) The memory controller of claim 32 wherein said characteristic comprises a physical layout of signal connections between said memory controller and said memory module.

38. (currently amended) A memory controller comprising a memory module interface to at least one memory module, said memory module including serial presence detect memory; wherein said memory controller:

generates multiple clock signals at different frequencies;

accesses serial presence detect memory;

keeps a running tally of the number of said memory modules based on said accesses to said serial presence detect memory;

obtains information from said serial presence detect memory that includes at least one characteristic of said memory module; and

~~selects one of said clock frequencies for driving said memory module interface~~ based on at least one of a final tally of the number of said memory modules and said obtained information, selects only one of said multiple clock signals for driving said memory module interface.

39. (original) The memory controller of claim 38 wherein said characteristic comprises a speed grade of said memory module.

40. (currently amended) A memory controller comprising a memory module interface to at least one memory module and at least two PLLs to generate respective clock signals of different frequencies, said memory module including serial presence detect memory; wherein said memory controller:

accesses serial presence detect memory;

obtains information from said serial presence detect memory that includes at least the number of components in said memory module; and

~~provides a memory module interface at a clock rate~~ based on said obtained information, selects only one of said clock signals to provide an operating speed of said memory module interface.

41. (currently amended) A memory controller comprising a memory module interface to at least one memory

module, said memory module including serial presence detect memory; wherein said memory controller:

accesses serial presence detect memory;
generates multiple clock signals at different frequencies;

keeps a running tally of the number of said memory modules based on said accesses to said serial presence detect memory;

obtains information from said serial presence detect memory wherein said obtained information comprises a speed grade of said memory module; and

~~selects one of said clock frequencies for driving said memory module interface~~ based on at least a final tally of the number of said memory modules and said obtained information, selects only one of said multiple clock signals for driving said memory module interface.

42. (canceled)

43. (currently amended) Apparatus for selecting an operating speed of a memory module interface in a computer system, said system comprising a central processing unit, a memory controller, and at least one memory module comprising a serial presence detect memory, said apparatus comprising:

means for counting the number of said memory modules;

means for keeping a running tally of the number of said memory modules based on said means for counting;

means for generating multiple clock signals at different frequencies to provide selectable operating speeds of said memory interface; and

~~means for selecting one of said multiple clock frequencies to provide an operating speed~~ based on at least a final tally of the number of said memory modules, means for selecting only one of said multiple clock signals to provide said operating speed of said memory module interface.

44. (previously presented) The apparatus of claim 43 wherein said selecting comprises means for generating memory module interface signals comprising clock, address, and data signals at a frequency based on said final tally of the number of said memory modules

45. (currently amended) The apparatus of claim 43 further comprising means for obtaining information from said serial presence detect memory, said information including at least one characteristic of said memory module; wherein said means for selecting selects one of said multiple clock ~~frequencies~~ signals in accordance with at least one of said final tally of the number of said memory modules and said obtained information

46. (previously presented) The apparatus of claim 45 wherein said characteristic comprises the number of components in each said memory module.

47. (previously presented) The apparatus of claim 45 wherein said characteristic comprises a speed grade of said memory module.

48. (previously presented) The apparatus of claim 45 wherein said characteristic comprises a manufacturer of said memory module.

49. (previously presented) The apparatus of claim 45 wherein said characteristic comprises a type of said memory module.

50. (previously presented) The apparatus of claim 45 wherein said characteristic comprises a physical layout of signal connections between said memory controller and said memory module.

51. (currently amended) Apparatus for selecting an operating speed of a memory module interface in a computer system, said system comprising a central processing unit, a memory controller, and at least one memory module comprising a serial presence detect memory, said apparatus comprising:

means for counting the number of said memory modules;

means for keeping a running tally of the number of said memory modules based on said means for counting;

means for generating multiple clock signals at different frequencies;

means for obtaining information from said serial presence detect memory that includes at least one characteristic of said memory module; and

~~means for selecting said operating speed of said memory module interface~~ in accordance with at least one of a final tally of the number of said memory modules and obtaining information, means for selecting only one of said multiple clock signals to provide said operating speed of said memory module interface.

52. (currently amended) Apparatus for selecting an operating speed of a memory module interface in a computer system, said system comprising a central processing unit, a memory controller, and at least one memory module comprising a serial presence detect memory, said apparatus comprising:

~~means for counting the number of said memory modules;~~

~~means for keeping a running tally of the number of said memory modules based on said means for counting;~~

means for generating multiple clock signals at different frequencies;

means for obtaining information from said serial presence detect memory that includes at least the number of components in each said memory module; and

~~means for selecting said operating speed of said memory module interface in accordance with at least one of a final tally of the number of said memory modules and said~~
means for obtaining information, means for selecting only one of said multiple clock signals to provide said operating speed of said memory module interface.

53. (currently amended) Apparatus for selecting an operating speed of a memory module interface in a computer system, said system comprising a central processing unit, and a memory controller, and at least one memory module comprising a serial presence detect memory, said apparatus comprising:

means for counting the number of said memory modules;

means for keeping a running tally of the number of said memory modules based on said means for counting;

means for generating multiple clock signals at different frequencies;

means for obtaining information from said serial presence detect memory that includes at least a speed grade of said memory module; and

~~means for selecting said operating speed of said memory module interface~~ in accordance with at least one of a final tally of the number of said memory modules and obtaining information, means for selecting only one of said multiple clock signals to provide said operating speed of said memory module interface.